$y(0) = x(0)h(0)$
$y(1) = x(1)h(0) + x(0)h(1)$
$y(2) = x(2)h(0) + x(1)h(1) + x(0)h(2)$
..........................
..........................
$y(H-1) = x(H-1)h(0) + x(H-2)h(1) + x(H-3)h(2) + \ldots\ldots\ldots\ldots +x(0)h(H-1)$ ----**saturation from this point onwards**

$y(H) = \quad x(H)h(0) + x(H-1)h(1) + x(H-2)h(2) + \ldots\ldots\ldots\ldots +x(1)h(H-1)$
$y(H+1) = x(H+1)h(0) + x(H)h(1) + x(H-1)h(2) + \ldots\ldots\ldots\ldots +x(2)h(H-1)$
..........................
..........................
$y(N-1) = x(N-1)h(0) + x(N-2)h(1) + x(N-3)h(2) + \ldots\ldots +x(N-H+1)h(H-1)$

**Figure 1**

2 1

y(0) = **x(0)h(0)**

y(1) = **x(1)h(0) + x(0)h(1)**

y(2) = **x(2)h(0) + x(1)h(1) + x(0)h(2)**

y(3) = **x(3)h(0) + x(2)h(1) + x(1)h(2)** + x(0)h(2)

y(4) = **x(4)h(0) + x(3)h(1) + x(2)h(2)** + x(1)h(2) + x(0)h(1)

y(5) = **x(5)h(0) + x(4)h(1) + x(3)h(2)** + x(2)h(2) + x(1)h(1) + x(0)h(0)

y(6) = **x(6)h(0) + x(5)h(1) + x(4)h(2)** + x(3)h(2) + x(2)h(1) + x(1)h(0)

y(7) = **x(7)h(0) + x(6)h(1) + x(5)h(2)** + x(4)h(2) + x(3)h(1) + x(2)h(0)

y(8) = **x(8)h(0) + x(7)h(1) + x(6)h(2)** + x(5)h(2) + x(4)h(1) + x(3)h(0)

y(9) = **x(9)h(0) + x(8)h(1) + x(7)h(2)** + x(6)h(2) + x(5)h(1) + x(4)h(0)

y(10) = **x(10)h(0) + x(9)h(1) + x(8)h(2)** + x(7)h(2) + x(6)h(1) + x(5)h(0)

**Figure 2**

y(0) = x(0)h(0)

y(1) = x(1)h(0) + x(0)h(1)

y(2) = x(2)h(0) + x(1)h(1) + x(0)h(2)

y(3) = x(3)h(0) + x(2)h(1) + x(1)h(2) + x(0)h(3)

No reusability

y(4) = x(4)h(0) + x(3)h(1) + x(2)h(2) + x(1)h(3) + x(0)h(2)

2 1 y(5) = x(5)h(0) + x(4)h(1) + x(3)h(2) + x(2)h(3) + x(1)h(2) + x(0)h(1)

y(6) = x(6)h(0) + x(5)h(1) + x(4)h(2) + x(3)h(3) + x(2)h(2) + x(1)h(1) + x(0)h(0)

y(7) = x(7)h(0) + x(6)h(1) + x(5)h(2) + x(4)h(3) + x(3)h(2) + x(2)h(1) + x(1)h(0)

y(8) = x(8)h(0) + x(7)h(1) + x(6)h(2) + x(5)h(3) + x(4)h(2) + x(3)h(1) + x(2)h(0)

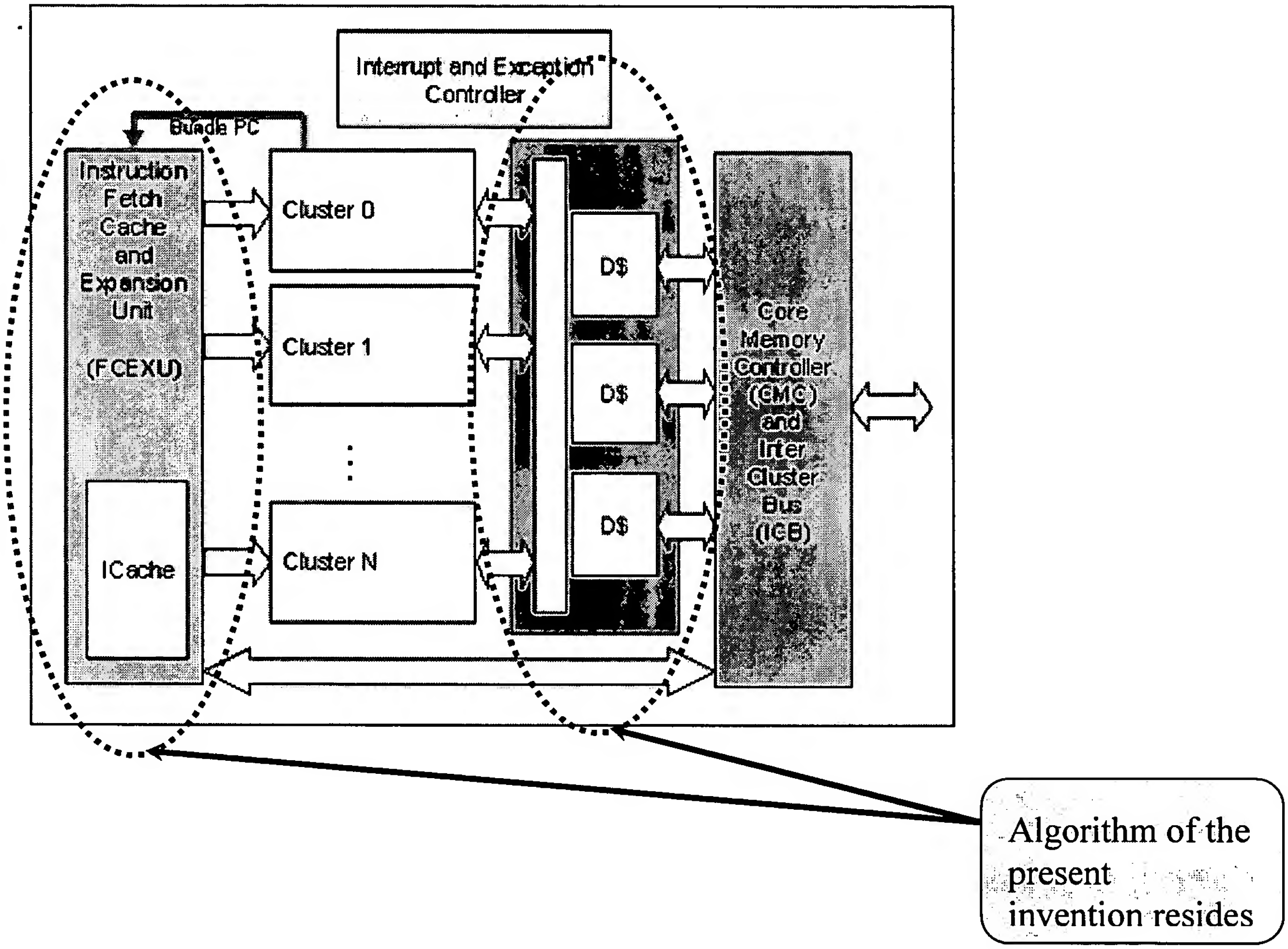
y(9) = x(9)h(0) + x(8)h(1) + x(7)h(2) + x(6)h(3) + x(5)h(2) + x(4)h(1) + x(3)h(0)

y(10) = x(10)h(0) + x(9)h(1) + x(8)h(2) + x(7)h(3) + x(6)h(2) + x(5)h(1) + x(4)h(0)

y(11) = x(11)h(0) + x(10)h(1) + x(9)h(2) + x(8)h(3) + x(7)h(2) + x(6)h(1) + x(5)h(0)

y(12) = x(12)h(0) + x(11)h(1) + x(10)h(2) + x(9)h(3) + x(8)h(2) + x(7)h(1) + x(6)h(0)

**Figure 3**



Interrupt and Exception Controller
Bundle PC
Instruction Fetch Cache and Expansion Unit
(FCEXU)
ICache
Cluster 0
Cluster 1
Cluster N
D$
D$
D$
Core Memory Controller (CMC) and Inter Cluster Bus (ICB)
Algorithm of the present invention resides


Figure 4

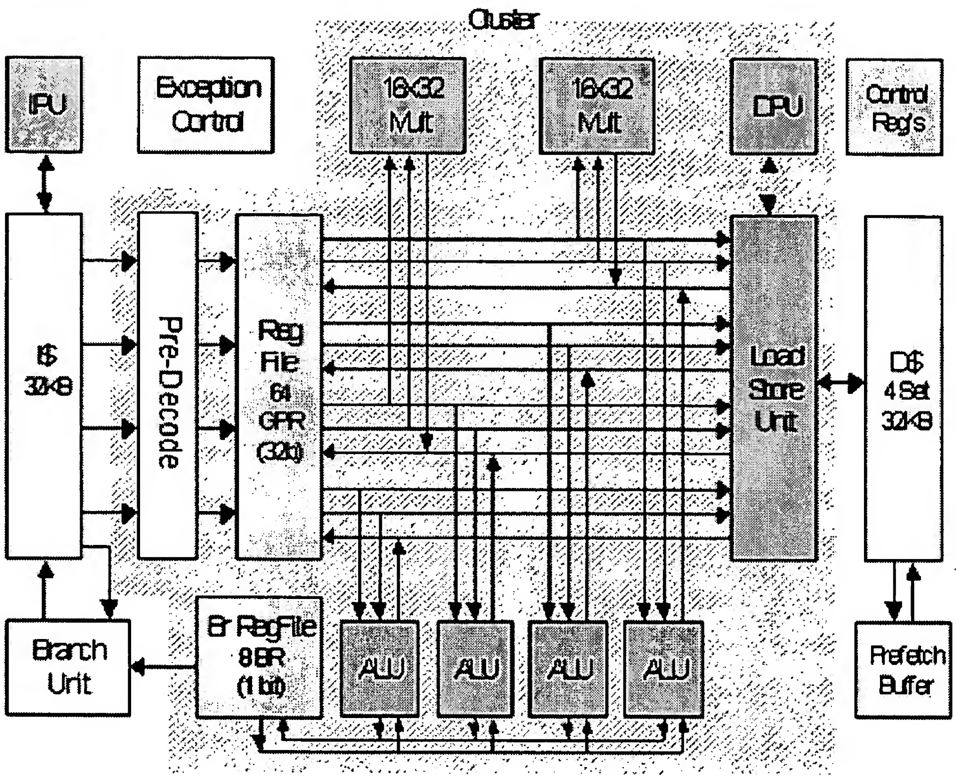

Cluster
IPU
Exception Control
16x32 Mult
16x32 Mult
DPU
Control Reg's
I$ 32KB
Pre-Decode
Reg File 64 GPR (32b)
Load Store Unit
D$ 4 Set 32KB
Branch Unit
Br RegFile 8 BR (1 bit)
ALU
ALU
ALU
ALU
Prefetch Buffer

**Figure 5**